

REMARKS

Reconsideration of the application in view of the above amendments and the following remarks is requested. Claims 31-52 are in this application. Claims 1-30 have been cancelled. Claims 31, 37, 42, and 48 have been amended, not to overcome the prior art, but to alternately claim the present invention.

The Examiner rejected claims 31-36, 38-47, and 49-52 under 35 U.S.C. §102(e) as being anticipated by Li et al. (U.S. Patent No. 6,162,368). For the reasons set forth below, applicant respectfully traverses this rejection.

Claim 31 recites, in part,

“chemically-mechanically polishing . . . , the layer of first material having a substantially planar top surface as soon as the layer of second material is substantially all removed from the layer of first material.”

Independent claim 42 recites the same limitations.

In rejecting the claims, the Examiner pointed to the layer of polysilicon 16, which is shown in FIG. 2A of Li, as constituting the layer of first material required by the claims, and the native oxide layer 18, which is shown in FIG. 2A of Li, as constituting the layer of second material. The Examiner also pointed to the chemical-mechanical polishing steps shown in FIGS. 2D-2F of Li as constituting the chemical-mechanical polishing element required by the claims.

In the amendment filed on November 7, 2005, applicant noted that claims 31 and 42 require that the layer of first material have a substantially planar top surface as soon as the layer of second material is substantially all removed from the layer of first material. As shown in FIG. 2C, Li teaches that as soon as native oxide layer 18 (the second material) has been substantially all removed, polysilicon layer 16 (the first material) does not have a substantially planar top surface as required by claims 31 and 42, but instead has a severely non-planar top surface.

In the present rejection, the Examiner pointed to FIGS. 2A-2I, specifically FIG. 2D, and the text from column 4, line 37 through column 6, line 54 of Li as teaching that polysilicon layer 16 (the first material) has a substantially planar top surface as soon as substantially all of native oxide layer 18 (the second material) has been removed. The Li reference, however, does not support the Examiner's contention.

Specifically, Li teaches:

"[a]s shown by FIGS. 2B and 2C, the brief polishing at polishing station 25a with oxide-polishing slurry 50a is sufficient to remove native oxide layer 18 from the substrate surface. Referring to FIGS. 2C and 2D, once the native oxide layer has been removed, the substrate is polished with polysilicon-polishing slurry 50b. This polishing continues until polysilicon layer 16 is partially or substantially planarized, i.e., the large scale topography such as the peaks and valleys have been substantially removed." [Underlining added.] (See from column 5, line 64 to column 6, line 6 of Li.)

Thus, the Li reference expressly teaches that the peaks and valleys of polysilicon layer 16 (the first material) are not removed until after native oxide layer 18 (the second material) has been removed. As a result, it is not possible for polysilicon layer 16 (the first material) to have a substantially planar top surface as soon as substantially all of native oxide layer 18 (the second material) has been removed.

In the Response to Arguments section, the Examiner also pointed to FIG. 2G of Li and argued that after the CMP process and removal of the material layer 18, the first material layer 16 has a substantially planar surface 19. Applicant respectfully notes, however, that claims 31 and 42 do not require that the layer of first material have a substantially planar top surface a few processing steps after substantially all of the layer of second material has been removed. Instead, the claims require that the layer of first material have a substantially planar top surface

as soon as the layer of second material has been substantially all removed from the layer of first material.

As a result, the chemical-mechanical polishing taught by Li can not be read to be the chemical-mechanical polishing required by the claims. Therefore, since the Li reference does not teach or suggest the chemical-mechanical polishing element required by claims 31 and 42, claims 31 and 42 are not anticipated by Li. In addition, since claims 32-36 and 38-41 depend either directly or indirectly from claim 31, these claims are not anticipated by Li for the same reasons as claim 31. Further, since claims 43-47 and 49-52 depend either directly or indirectly from claim 42, claims 43-47 and 49-52 are not anticipated by Li for the same reasons as claim 42.

With further respect to claims 38 and 49, these claims recite "forming a layer of third material over the planarized layer of material." Claims 38 and 49 depend from claims 31 and 42, respectively, which recite "the planarized layer of material lying over the wafer upper levels and the wafer lower level." Thus, the layer of third material must be formed over the planarized layer of material which, in turn, must lie over the wafer upper level.

In rejecting the claims, the Examiner pointed to FIGS. 2A-2I, and the text from column 4, line 37 to column 6, line 54 of Li as teaching the formation of a third layer of material. In the Response to Arguments section, the Examiner pointed to FIG. 2I of Li and argued that polishing pad 110 (114) can be read to be the third layer of material.

Since the third layer of material must be formed over the planarized layer of material, and the planarized layer of material must lie over the wafer upper levels, applicant assumes that the Examiner has also read buffering solution 50d shown in FIG. 2I of Li to be the planarized layer of material. As noted above, claims 31 and 42 require that the chemical-mechanical polishing form the planarized layer of material. However, applicant has been unable to find any discussion in Li that teaches or suggests that the chemical-mechanical polishing forms buffering solution

50d. As a result, claims 38 and 49 are not anticipated by Li for this additional reason.

With further respect to claims 39 and 50, these claims recite "wherein the layer of third material is a mask." In rejecting the claims, the Examiner pointed to FIGS. 2A-2I, and the text from column 4, line 37 to column 6, line 54 of Li as teaching the formation of a third layer of material as a mask. Applicant, however, has been unable to find anything in the figures or cited text that teaches or suggests the formation of a layer of third material as a mask. Further, as noted above, the Examiner argued that polishing pad 110 (114) can be read to be the third layer of material. A polishing pad, however, can not be read to be a mask. As a result, claims 39 and 50 are not anticipated by Li for this further reason.

With further respect to claims 40 and 51, these claims recite wherein "the planarized layer of material includes doped polysilicon; and the layer of third material lowers a resistance of doped polysilicon." In rejecting the claims, the Examiner pointed to FIGS. 2A-2I, and the text from column 4, line 37 to column 6, line 54 of Li as teaching the formation of a third layer of material. Applicant, however, has been unable to find anything in the figures or cited text that teaches or suggests the formation of a layer of third material that lowers a resistance of doped polysilicon.

The Examiner also rejected claims 37 and 48 under 35 USC §103(a) as being unpatentable over Li et al. in view of Weling et al. (U.S. Patent No. 5,378,318). In rejecting the claims, the Examiner argued that Li teaches all of the claimed limitations except for a specific etch selectivity. However, as noted above, the Li et al. reference does not teach all of the claimed limitations. As a result, claims 37 and 48 are patentable over the Li et al. reference in view of the Weling et al. reference for the same reasons that claims 31 and 42 are patentable over the Li et al. reference in view of the Weling et al. reference.

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Thus, for the foregoing reasons, it is submitted that the application is in a condition for allowance. Therefore, the Examiner's early re-examination and reconsideration are respectively requested.

Respectfully submitted,

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